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Analytical Procedure for Estimating Reliability of Randomly Excited Structures

An analytical procedure for predicting the reliability of structures under stationary random excitations has been developed. The analysis takes into account the statistical variation of the material strength, and the interactions between the catastrophic and fatigue failure modes, which have not previously been considered in random vibration analyses.

The analysis employs the concepts of fracture mechanics and extreme point processes associated with stationary narrow-band random vibrations. Since the statistical variation of material strength is an important factor in determining the structural safety, disregarding this factor and the failure modes interactions yields a nonconservative estimate of reliability. This estimate tends to become more critical with increasing flaw propagation factor or statistical dispersion of the material strength.

Note:

Requests for further information may be directed to:

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Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

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